Other Air Pollutants

In addition to the six criteria pollutants, DNR's APCP also regulates other pollutants, including asbestos and hazardous air pollutants.

ASBESTOS:
Asbestos is a naturally occurring mineral that takes the form of hollow microscopic fibers. Before it was recognized as a carcinogen, asbestos was widely used for insulation and fireproofing. With age, it breaks down and becomes a hazard to anyone who breathes its airborne fibers. Federal and state laws regulate the removal of asbestos from buildings and DNR monitors these activities.

HAZARDOUS AIR POLLUTANTS (HAPS):
Some air pollutants can cause quick and painful death, cancer, reproductive disorders and environmental damage such as acid rain. The EPA has designated these pollutants as hazardous air pollutants, which may present a hazard to public health and safety if released in sufficient quantity.

Major Air Pollutants

The benchmarks for clean air in Missouri are the National Ambient (outdoor) Air Quality Standards (NAAQS) established by the EPA under the Clean Air Act. The standards address six "criteria pollutants" considered harmful to public health and the environment: ozone, lead, inhalable particles, carbon monoxide, nitrogen dioxide and sulfur dioxide. These standards are found on page 11.

OZONE (URBAN SMOG): Ground-level ozone is a colorless gas, the most harmful part of what we commonly know as "smog." Ozone is not directly emitted. It forms on sunny hot summer days when sunlight causes a reaction between volatile organic compounds (VOCs) and nitrogen oxides (NOx). Vehicles, power plants and industrial boilers are common sources of nitrogen oxides. Gasoline powered vehicles are a major source of VOCs.

"Good up high - bad nearby"
There are two types of ozone: stratospheric (upper atmosphere) and ground-level ozone. Ozone in the stratosphere occurs naturally and is desirable, shielding the earth from ultraviolet rays. But ozone at ground level is a powerful respiratory irritant.

AIRBORNE LEAD: In Missouri, airborne lead and its compounds are produced mainly by lead smelters. Children under six are the most endangered by airborne lead, so the standard has been established to protect their health. In 1985, 73 percent of airborne lead came from vehicle exhaust pipes. This dropped to 34 percent by 1988 due to federal controls on gasoline that started in the mid-1970s.

INHALABLE PARTICLES: Inhalable particles include airborne dust, pollen, soot and aerosol sprays. Scientists also sometimes refer to these as "particulate matter." Current federal standards apply to particles less than 10 microns in diameter, or PM_{10}, emitted mainly by vehicles, industry and farms. Wind and rainfall cause seasonal variations in PM_{10}. In 1997, the EPA set new standards for even finer particles less than 2.5 microns in diameter, or $PM_{2.5}$ (see page 9).

CARBON MONOXIDE: Carbon monoxide (CO), formed by the incomplete combustion of fuel, is a most common pollutant. More than 75 percent of CO emissions come from vehicle exhaust and the highest concentrations are caused by congestion in metropolitan areas. Though deadly, CO is transformed rapidly into carbon dioxide.

NITROGEN DIOXIDE: Almost all nitrogen dioxide is man-made. If fuel is burned above 1200 degrees Fahrenheit, airborne nitrogen forms highly reactive nitrogen oxides such as nitrogen dioxide. Principal sources are power plants, industrial boilers and vehicles.

SULFUR DIOXIDE: Sulfur oxides are produced by burning sulfur-containing fuels such as coal and oil, by smelting metals and by other industrial processes. Sulfur dioxide (SO_2) composes about 95 percent of these gases.

Health Effects of Air Pollution

Pollutant	*Health Effects*
OZONE: A colorless gas, the most harmful part of what we commonly call "smog."	Throat irritation, congestion, chest pains, nausea and labored breathing. Aggravation of existing lung or heart conditions, allergies and asthma-. Ozone is especially harmful to those who work or play outside. Ozone is also harmful to plant life, damaging forests and reducing crop yields.
LEAD: Compounds of lead emitted as particles or fumes.	Low doses damage the central nervous system of fetuses and children, causing seizures, mental retardation and behavioral disorders. In children and adults lead causes fatigue, disturbed sleep, decreased fitness, and damage to kidneys, liver and blood-forming organs. High levels damage the nervous system and cause seizures, coma and death.
INHALABLE PARTICLES (PM_{10}): A broad class of particles 10 micrometers or smaller in diameter, that may include airborne soot, dust, pollen and aerosol sprays.	Increased likelihood of chronic or acute respiratory illness. Difficulty breathing, aggravation of existing respiratory or cardiovascular illness and lung damage.
INHALABLE PARTICLES ($PM_{2.5}$): Includes a broad class of particles 2.5 micrometers or smaller in diameter, such as metals, elemental carbon, condensed aerosols, nitrates and sulfates, as well as other compounds specific to certain areas of the country.	Results in respiratory problems such as hoarseness, sore throat, wheeze, chest pain, loss of lung flexibility and reduction of lung function. Increased potential for the development of chronic lung disease. This damage to the lungs can lead to episodic short-term illnesses, increasing the number of school absences, lost work days, hospital admissions and respiratory-related deaths.
CARBON MONOXIDE: An odorless, colorless, tasteless, poisonous gas.	Impaired vision and manual dexterity, weakness and mental dullness. At high levels: vomiting, fast pulse and breathing, followed by slow pulse and breathing, then collapse and unconsciousness.
NITROGEN DIOXIDE: A poisonous, reddish-brown to dark brown gas with an irritating odor.	Lung inflammation and lower resistance to infections like bronchitis and pneumonia. Suspected of causing acute respiratory diseases in children.
SULFUR DIOXIDE: A colorless gas with a strong suffocating odor.	Irritation of throat and lungs with difficulty in breathing. Aggravation of existing respiratory or cardiovascular illness.
HAZARDOUS AIR POLLUTANTS: Numerous chemicals classified by their hazardous health effects.	May cause cancer, reproductive disorders and death.
ASBESTOS: Densely packed microscopic fibers, once used for insulation and fireproofing.	Lung cancer, asbestosis (a progressive irreversible scarring of the lungs) and mesothelioma (cancer of the chest cavity's lining).